

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ERICSSON INC.,
Petitioner

v.

KONINKLIJKE KPN N.V.,
Patent Owner

Patent No. 7,092,705

**DECLARATION OF DR. ZYGMUNT HAAS IN SUPPORT OF PETITION
FOR INTER PARTES REVIEW OF U.S. PATENT NO. 7,092,705**

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LIST OF EXHIBITS¹

Ex. 1001	U.S. Patent No. 7,092,705
Ex. 1004	Prosecution History of U.S. Patent No. 7,092,705
Ex. 1005	<i>Madebrink</i> (U.S. Patent No. 5,434,798)
Ex. 1006	<i>Feuerstein</i> (U.S. Patent No. 6,141,565)
Ex. 1007	<i>Djoko</i> (U.S. Patent No. 6,085,335)
Ex. 1008	<i>Sheridan</i> (U.S. Patent No. 6,725,032)
Ex. 1009	<i>Clarkson</i> (U.S. Patent No. 6,611,500)
Ex. 1010	<i>Shipman</i> (GB Application No. 0022743.9)
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Ex. 1012	<i>Shipman</i> (EP1221786)
Ex. 1013	<i>Rappaport</i> (U.S. Patent No. 7,096,173)

¹ The list is of documents that I reviewed and discussed with counsel. I asked counsel to put this table in my report for reference purposes.

I, Zygmunt Haas, do hereby declare as follows:

I. INTRODUCTION

1. I have been retained by counsel for Ericsson Inc. (“Ericsson” or “Petitioner”) and asked to review and provide my opinion on the patentability of claims 1-7, 22-26, 28, 31, and 32 of U.S. Patent 7,092,705 (Ex. 1001, “’705 Patent”).

2. I am being compensated for my work in this matter at my current standard hourly rate. I am also being reimbursed for reasonable and customary expenses associated with my work and testimony in this investigation. My compensation is not contingent on the outcome of this matter or the specifics of my testimony.

II. QUALIFICATIONS

3. A detailed description of my professional qualifications, including a listing of my specialties/expertise and professional activities, is contained in my curriculum vitae, a copy of which, as I understand, is provided as Exhibit 1003. In what follows, I provide a short summary of my professional qualifications.

4. I am a Professor and Distinguished Chair in Computer Science at the Computer Science department of the University of Texas at Dallas. I also hold the title of Professor Emeritus at the School of Electrical and Computer

Engineering at Cornell University. Over the years, I provided technical consulting services in intellectual property matters, which have included writing expert reports and providing deposition and trial testimony in the areas of my expertise, including wireless communication technologies.

5. I received my Bachelor of Science Degree in Electrical Engineering, *summa cum laude*, from Technion (IIT), Israel, in 1979, and a Master of Science Degree in Electrical Engineering in 1985. Subsequently, in 1988, I authored the thesis titled “Packet Switching in Fiber- Optic Networks” as part of earning my Ph.D. in Electrical Engineering from Stanford University, Stanford, California.

6. I have worked for about 35 years in the fields of Electrical Engineering and Computer Science. The primary focus of my work has been, in general, on communication and networking systems, with an emphasis on wireless communication and wireless and mobile networks. Throughout my professional career, I have authored and co-authored numerous technical papers and book chapters related to wireless communication networks. In my work, among other topics, I have researched wireless networks, in general, including protocols for wireless networks. Specifically, I have written numerous papers on various schemes for wireless systems. Some of my works on wireless and mobile systems have received prominent awards. For instance, in 2016, I received the IEEE

ComSoc AHSN Recognition Award for “outstanding contribution to securing ad hoc and sensor networks” from the IEEE Communication Society in 2016. In 2012, I received the IEEE ComSoc Wireless Communications Technical Committee Recognition Award, which recognizes individuals for outstanding technical contributions in the field for their service to the scientific and engineering communities. As another example, I received the “Best Paper Award” for the paper “Optimal Resource Allocation for UWB Wireless Ad Hoc Networks” from the IEEE International Symposium on Personal Indoor and Mobile Radio Communications (PIMRC) conference in 2005. Finally, in 2003, I received the “Highly Commended Paper Award” for co-authoring “Performance Evaluation of the Modified IEEE 802.11 MAC for Multi-Channel Multi-Hop Ad Hoc Network,” directed at advanced information networking and applications. Furthermore, many of my papers have been extensively cited by other authors, as indicated by various citation indices. For example, my paper on “Securing Ad Hoc Networks,” co-authored with a Ph.D. student at the time, has been cited over 4000 times by other publications according to the *Google Scholar* index. I have also taught courses that cover wireless communications and networking technologies at the graduate and undergraduate levels. In addition, I have been invited to many international conferences to make keynote speeches regarding wireless and mobile networks.

7. My employment history following my graduation from Stanford University began at the Network Research Department of AT&T Bell Laboratories in 1988. At AT&T Bell Laboratories, I pursued research on wireless communications, mobility management, network security, fast protocols, optical networks, and optical switching. During my tenure at AT&T, I also worked for the AT&T Wireless Center of Excellence, where I investigated various aspects of wireless and mobile networks. As part of my employment at AT&T, I also worked on multimedia conferencing systems.

8. In 1995, I joined the faculty of the School of Electrical & Computer Engineering, Cornell University, and with time was promoted to Tenured Full Professor. At Cornell, I headed the Wireless Networks Lab, a research group with extensive contributions in the area of wireless communication systems and networks. In 2013, I retired from Cornell with the title of Emeritus Professor, and I joined the Computer Science Department at the University of Texas at Dallas with the title of Professor and Distinguished Chair in Computer Science. At Cornell and at the University of Texas, I have taught dozens of courses related to computer networking and wireless communications. I have also served on various committees for the benefit of the scientific community.

9. I am a member of the Institute of Electrical and Electronic Engineers (IEEE) and the Association for Computing Machinery (ACM). In 2007,

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I was elevated to an IEEE Fellow, and in 2022, I was elevated to an ACM Fellow. I have also been named a Fellow of EAI (European Alliance for Innovation) and a Fellow of IET (Institution of Engineering and Technology). I have been responsible for organizing several workshops and delivering numerous tutorials at major IEEE and ACM conferences. I have served as editor of several publications, including the IEEE Transactions on Networking, the IEEE Transactions on Wireless Communications, the IEEE Communications Magazine, the Springer “Wireless Networks” journal, the Elsevier “Ad Hoc Networks” journal, the “Journal of High Speed Networks,” and the Wiley “Wireless Communications and Mobile Computing” journal. I have also been a guest editor of the IEEE Journal on Selected Areas in Communications for issues on “Gigabit Networks,” “Mobile Computing Networks,” and “Ad-Hoc Networks.” Finally, I have served as the Chair of the IEEE Technical Committee on Personal Communications (TCPC), now known as the IEEE Wireless Communications Technical Committee.

10. I have been involved in electrical engineering research since 1981, focusing primarily on networking systems, including security in mobile and wireless networks and communication protocols.

11. I regularly teach or have taught courses in Computer Networks, Wireless Networks, and Networks and Systems.

12. I am a named author on many book chapters, including “A Decision Theoretical Approach to Resource Allocation in Wireless Multimedia Networks,” in *Resource Allocation in Next Generation Wireless Networks*, Volume 5, W. Li and Y. Pan, Editors, Nova Science Publishers, 2006, chapter 1, pp.1-23; “Providing Ad-Hoc Connectivity with the Reconfigurable Wireless Networks,” in *Ad-Hoc Networks*, edited by Charlie Perkins, Addison Wesley, 1998; and “Mobile TCP: An Asymmetric Transport Protocol Design for Mobile Systems,” in *Mobile Multimedia Communications*, edited by D. J. Goodman and D. Raychadhuri, Plenum Publishing, 1997.

13. I am an inventor or co-inventor on over twenty issued patents, which are primarily in the fields of high-speed networking, wireless networks, and optical switching.

14. I have served on the editorial board for a number of professional journals, including *Wireless Communications and Mobile Computing*, *Wireless Networks Journal*, and the *Journal of High Speed Networks*. I have served as guest editor for the *IEEE Journal on Selected Areas in Communications* on several occasions.

15. My compensation, in this case, is in no way contingent on the results of these or any other proceedings related to the above-captioned patent.

III. SUMMARY OF MY OPINIONS

16. In my opinion, claims 1-7, 22-26, 28, 31, and 32 of the '705 Patent are unpatentable. My opinions are based on my expertise in the technology of the '705 Patent at the time the application was filed, as well as on my review of the '705 Patent, its file history, and the exhibits identified in the List of Exhibits above. If the patent owner is allowed to submit additional evidence pertaining to the validity of the '705 Patent, I reserve the right to update my analysis and conclusions as appropriate, if allowed, under the rules of this proceeding.

IV. INSTRUCTIONS

17. I am not an attorney. My analysis and my opinions are based on my expertise, as well as on the instructions that I have been given by counsel for the legal standards relating to patentability, as outlined in the rest of this section.

18. I have been informed by counsel that unpatentability in this proceeding must be proven by a preponderance of the evidence, and this is the standard I have used throughout my declaration. Further, I understand that each patent claim is considered separately for purposes of unpatentability.

19. I have been informed by counsel that a patent claim is unpatentable as “anticipated” if each and every feature of the claim is found in a single prior art reference.

20. I have been informed by counsel that a patent claim is unpatentable as “obvious” if, in view of a prior art reference or a combination of prior art references, it would have been obvious to a person of ordinary skill in the art (“POSITA”) at the time of the invention, taking into account:

- (a) the scope and content of the prior art;
- (b) the differences between the prior art and the claim under construction; and
- (c) the level of ordinary skill in the art.

21. I have been informed by counsel that legal principles regarding the unpatentability of a claim due to obviousness have been addressed by the U.S. Supreme Court. I have been informed by counsel that, while not absolute, the principles relating to a “motivation,” “suggestion,” or “teaching” in the prior art to combine references are useful in analyzing whether an invention is obvious. I have been informed by counsel that the suggestion or motivation may be either explicit or implicit and may come from knowledge generally available to a POSITA, from the nature of the problem to be solved, or from a combination of these factors. The test for an implicit motivation, suggestion, or teaching is what the combined teachings, knowledge of a POSITA, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art. The problem

examined is not the specific problem solved by the invention but the general problem that confronted the inventor before the invention was made.

22. I have been further informed by counsel that the U.S. Supreme Court has clarified that additional principles may also be applied in such an analysis. Some of those principles are set forth below.

23. I have been informed by counsel that it is no longer always required to present evidence of an explicit teaching, suggestion, or motivation to combine prior art references for purposes of determining whether an invention is obvious. Prior art can be combined based on an express teaching, suggestion, or motivation from the prior art itself or from a reasoned explanation of an expert or other witness.

24. I have been informed by counsel that a patent claim composed of several elements, however, is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. In order to prove obviousness, it must be shown that the improvement is not more than the predictable use of prior-art elements according to their established functions. To determine whether there was an apparent reason to combine the known elements in the way a patent claims, it will often be necessary to look to interrelated teachings of multiple pieces of prior art, to the effects of demands known to the design community or present in the marketplace, and to the background knowledge

possessed by a POSITA. Also, in determining obviousness, one must be aware of the distortion caused by hindsight bias and be cautious of arguments relying upon hindsight reasoning. An obviousness argument cannot be sustained by mere conclusory statements. Instead, it must be some articulated reasoning with some rational underpinnings to support the legal conclusion of obviousness.

25. In an obviousness analysis, it is my understanding that there are “secondary considerations” that should be analyzed. I am told that these considerations include (a) whether the prior art teaches away from the claimed invention, (b) whether there was a long felt but unresolved need for the claimed invention, (c) whether others tried but failed to make the claimed invention, (d) skepticism of experts, (e) whether the claimed invention was commercially successful, (f) whether the claimed invention was praised by others, and (g) whether the claimed invention was copied by others. I am not aware of any evidence that any of these secondary considerations exist here. I reserve the right to address any evidence that patent owner may present that pertains to secondary considerations of non-obviousness.

26. I have been informed by counsel that the Board construes claims according to the so-called “Phillips” standard. Under the Phillips standard, terms in a claim are given their ordinary and customary meaning, consistent with the patent’s specification, as understood by a POSITA. I have been informed by

counsel that what is to be considered includes the claims, the patent specifications and drawings, and the prosecution history, including any art listed by the examiner or the Applicant. I have been informed by counsel that information external to the patent, including expert and inventor testimony and unlisted prior art, are to be considered if ambiguities remain. In any event, expert testimony may be useful in helping to explain the technology.

V. EFFECTIVE FILING DATES AND PRIOR ART PATENTS AND PRINTED PUBLICATIONS

27. I have been informed by counsel that I am to consider July 9, 2001, to be the priority date for the '705 Patent, the date of filing for the earliest application in the claimed priority chain, and the earliest possible priority date for the '705 Patent. I express no opinion on whether the claims of the '705 warrant that priority date.

28. I rely upon the following references, all of which I have been informed by counsel that I should assume are prior art to all claims of the '705 Patent:

- *Madebrink* published on July 18, 1995 (*Madebrink*; Ex. 1005).
- *Feuerstein* published on October 31, 2000 (filed on November 13, 1997) (*Feuerstein*; Ex. 1006).
- *Djoko* published on July 4, 2000 (*Djoko*; Ex. 1007).
- *Sheridan* published on April 20, 2004 (filed on October 8, 1999) (*Sheridan*; Ex. 1008).

29. The chart below summarizes my conclusions of unpatentability regarding the claims of the '705 Patent that I have analyzed.

Ground	Conclusion	Challenged Claims
1	Obvious in view of <i>Madebrink</i> and <i>Feuerstein</i>	1-7, 22-26, 28, 31, and 32
2	Obvious in view of <i>Madebrink</i> and <i>Feuerstein</i> and <i>Shipman</i>	1-7, 22-26, 28, 31, and 32
3	Anticipated by <i>Djoko</i>	1, 22, 26, 28 and 31
4	Obvious in view of <i>Djoko</i> and <i>Sheridan</i>	2-6, 23-25, 29, and 32

VI. USE OF RULE-BASED EXPERT SYSTEMS FOR NETWORK MANAGEMENT

30. The use of rule-based systems for network management was well known by the priority date of the '705 Patent. Indeed, even before the priority date of the '705 Patent, communication systems, in general, and communication networks, in particular, have been developing at an increased rate, rendering them more complex and sophisticated than human operators could handle. This has been a well-recognized problem, especially in the area of network management, where there was a known shift in early 1970 to employ rule-based expert systems. Such systems were instrumental in many aspects of network management, such as

network configuration, user access control, accounting, fault detection, parameter settings, performance management, and in general, policy management.

31. More specifically, the area of configuration management in the context of network management includes rules that define operations such as: changing (adding/removal) of users, reconfiguration (addition/removal) of resources, and changing the operating parameters of a network resource. The area of performance management of a network includes rules that: monitor the network's health, the quality of service received by users, and determine appropriate actions that reconfigure the network as to improve the network performance. Other areas of network management have their own specific rules that they operate by.

32. In rule-based management systems, there are entities which determine the rules, entity or entities which monitor the rules to ensure that they apply, and entity or entities which take appropriate actions when the rules are violated. The later may include raising an alarm when a rule is breached.

33. The key elements of an architecture a rule-based systems include: rules, domain space, monitor/control, and actions. The domain space contains objects, which are elements of a managed system, and which are defined by their attributes. Actions are operations which may depend on the application. Finally, rules are statements (models of reasoning) and may have various structures. For

example, a rule can be stated in the format of *if-X-then-Y*, where *X* can be expressed by attributes of objects in the domain space, while *Y* is expressed as an appropriate action to be taken. A policy is created by attaching rule(s) to element(s) of the domain space.

34. Network Management can be invoked at various times, including the network design stage and the network operation, with the latter including network reconfiguration to improve the network operation and/or performance. Network reconfiguration can be prompted by the network operator, initiated by a customer, or be invoked by events in the networks (such as network growth, for example) or periodically/continuously. Monitoring by control systems can prompt changes, such as reconfiguration, to prevent degradation and/or improve the network performance.

35. An expert system, as the name indicates, is an analytical software tool that incorporates specialized knowledge to perform tasks that a trained human typically does. For the discussion here, the critical aspect of operation of such an expert system is that the tool can work when the available data is inaccurate and/or incomplete, can manage high system complexity, and can even be designed to learn. Based on the available knowledge, an expert system can decide in a particular situation how to continue. In contrast to traditional algorithmic approach to software, expert systems are non-procedural, meaning that expert-systems can

encounter and manage unexpected or previously unmet situations and conditions, which is similar to how humans may operate. Expert systems which structure their knowledge based on rules are known as Rule-based Expert Systems. I note that rule-based expert systems were well-known before the priority date of the '705 Patent.

VII. OVERVIEW OF THE '705 PATENT

36. As I explain in further detail below, the '705 Patent is directed to a known system and technique for modifying a radio network's parameter settings. The '705 Patent teaches that it was known that "configuration and reconfiguration of a cellular network is complex since the parameter settings of the different components of the cellular radio network affect each other." *See, e.g.*, Ex. 1001, 1:53-56. One example discussed in the background section of the '705 Patent is *Madebrink* (which is, as I understand, a patent assigned to Ericsson). *See, e.g.*, Ex. 1001, 1:56-2:29.

37. The '705 patent explains that *Madebrink* "describes a reconfiguration method and apparatus in which the cell parameters of particular mobile switching centres in a network are copied to a database, and the copied parameters are stored. A set of proposed changes to the stored parameters is prepared and the consistency of the prepared set of proposed changes is verified." *See, e.g.*, Ex. 1001, 1:56-63. "Alterations to the set of proposed changes responsive

to the verification are made and the verified set of proposed changes is copied to the concerned mobile switching centres.” *See, e.g.*, Ex. 1001, 1:63-66. “The verified set of proposed changes is then introduced into the network.” *See, e.g.*, Ex. 1001, 1:66-67.

38. The ’705 patent claims that *Madebrink*’s checking parameter consistency can be improved. *Madebrink*, according to the ’705 patent has a problem “relat[ing] to the type of rules used in performing the consistency check” because *Madebrink*’s rules “originate solely from technical requirements derived from cellular network technology.” *See, e.g.*, 1001, 2:35-40. This is an issue according to the ’705 patent, because “*it is not possible to deviate from the technically sufficient parameter setting requirements if operational practice experience reveals a different more preferable technical parameter setting.*” *See, e.g.*, 1001, 2:40-45 (italics formatting added).

39. The emphasized language above is what Applicant argued was innovative during the ’705 patent prosecution. During the prosecution Applicant argued that the claims are inventive because they include checking whether the modified parameter satisfies a “*a technically sufficient parameter setting requirement*” and “*a deviation from the setting requirement based on an operational requirement deduced from use of the radio network*” before storing the modified parameter for future use.

40. The '705 patent states that in the *Madebrink*'s invention it was "not possible to deviate from the technically sufficient parameter setting requirements if operational practice experience reveals a different more preferable technical parameter setting." *See, e.g.*, 1001, 2:40-45. I disagree with the '705 patent's statement. *Madebrink* teaches to optimize the network parameters, which is an example of deviating from the technically sufficient parameter setting. Ex. 1005, 11:64-68. I also disagree with the Applicant's characterization of the '705 Patent as "innovative" because it teaches to check whether the modified parameter satisfies a "a technically sufficient parameter setting requirement" and "a deviation from the setting requirement based on an operational requirement deduced from use of the radio network" before storing the modified parameter for future use. A POSITA would have known how to deviate from a baseline setting (i.e., a technically sufficient parameter setting) when a preferable setting is revealed by operation experience. As discussed in this declaration, performing such a deviation from the setting requirement was known at the priority date of the '705 Patent.

41. The '705 Patent even admits that "check[ing] the consistency of proposed parameter changes" was known. *See, e.g.*, Ex. 1001, 2:25-29. It was also known to a POSITA to check "the consistency of the proposed parameter changes

before the changes are implemented in the cellular network.” *See, e.g.*, Ex. 1001, 2:23-25.

42. Although the ’705 patent fails to mention it, prior art also teaches using “rules of parameter optimization from human experts” and “automatically chang[ing] the relevant parameter values based on the *field data*, and iteratively *evaluat[ing] their merits using [a] simulator.*” *See, e.g.*, Ex. 1007, 13:26-32; *see also* Ex. 1009, 10:17-28 (describing optimizing parameters based on specific goals). *Madebrink* also explains that “mobile cellular networks have many parameters and many requirements,” and “each cell has certain associated parameters or characteristics which must be properly maintained to ensure proper operation of the cellular network.” *See, e.g.*, Ex. 1005, 1:47-56.

43. Prior to *Madebrink*’s 1991 disclosure, “manual or semi-manual ad hoc methods have been used to introduce parameter changes in the cellular networks for reconfiguration purposes and to check the accuracy of the proposed parameter changes.” *See, e.g.*, Ex. 1005, 1:57-61. At least by the time of *Madebrink*’s disclosure, it became known to permit “preparing a set of proposed changes to parameters and verifying, via a computer program, the consistency of the prepared set of proposed changes and making any necessary alterations to the set of proposed changes responsive to the verification. *See, e.g.*, Ex. 1005, cl. 1.

Once the proposed changes are verified, they are introduced into the system for future use.

44. The changes were verified using a “consistency check,” where the modified parameters were tested against known rules. *See, e.g.*, Ex. 1005, 13:26-45. And, as a POSITA would have expected, *Madebrink* teaches that the “operator can specify limit values for the checked parameters” and “thresholds can be set for each check rule....” *See, e.g.*, Ex. 1005, 14:13-16.

45. To solve the “problem” of “only” pre-programmed rules, the ’705 Patent discloses using “technically preferable requirements” and optimization of the technical requirement based on real-world use of the network, i.e., a deviation from the technically sufficient setting. *See, e.g.*, Ex. 1001, 3:5-13.

46. The ’705 provides an example of the parameter optimization technique described above where the technically sufficient requirement (20Hz channel distance) is optimized to (50Hz) based on the real-world usage of the parameter.

Moreover, it is preferable that the bare technically sufficient requirements can be altered according to rules obtained from daily operational use of the radio network. It can, e.g., be ***technically sufficient to have a channel distance of 20 Hz between different cells***. All channel distances above this value then will pass the bcc/bcch consistency check. However, in

practice it may be that ***a channel difference of 50 Hz between the cells guarantees a more reliable operation.*** In that case, according to the invention, it is possible to use *the preferred channel distance of 50 Hz*, as obtained from the operational practice as a business rule instead of the technically sufficient channel distance.

See, e.g., Ex. 1001, 6:4-15 (italics and bold formatting added).

VIII. THE '705 PATENT PROSECUTION HISTORY

47. I have reviewed the prosecution history of the '705 Patent. The Examiner rejected the initially filed claims based on *Madebrink*. *See, e.g.*, Ex. 1004, 149. The Applicant responded by amending the claims as shown below to add the concept of a rule that deviates “from at least one technically sufficient parameter setting requirement.”

Claim 1 (currently amended): Method for checking at least one modified parameter ~~and/or value~~ obtained from changing at least one operational parameter ~~and/or value~~ of an at least one component of a radio network wherein said checking is performed on the basis of at least one business rule comprising at least one operational requirement deduced from operational use of the radio network and deviating from at least one technically sufficient parameter setting requirement.

See, e.g., Ex. 1004, 123. After making this amendment, Applicant argued that *Madebrink* does not disclose “deviating from at least one technically sufficient

parameter setting.” In the Applicant’s explanation, the “a technical requirement” is a baseline rule, e.g., 20Hz, that is less strict than an optimized setting requirement, e.g., 50Hz. *See, e.g.*, Ex. 1004, 137. I disagree. *Madebrink* does disclose how to deviate from a baseline parameter setting. *See, e.g.*, my discussion in §XI.A.

48. Nevertheless, the Examiner then rejected the claims based on *Madebrink* in view of *Djoko*. *See, e.g.*, Ex. 1004, 88. This caused Applicant to cancel each pending claim and file new claims. *See, e.g.*, Ex. 1004, 40. The new claims issued as the ’705 patent.

Claims 1-33 (canceled)

Claim 34 (new): A method for verifying a modified parameter obtained from changing an operational parameter of a component of a radio network, the method comprising the steps of:

before the modified parameter is implemented in the network, checking the modified parameter on the basis of a rule so as to yield a result, said rule comprising both a technically sufficient parameter setting requirement and a deviation from the setting requirement based on an operational requirement deduced from use of the radio network; and

if the result indicates that the rule has been obeyed, storing the modified parameter in the network such that subsequent network operation will respond to the modified parameter.

Id.

49. Consistent with the '705 Patent's background, Applicant argued that *Madebrink*'s changes are "solely technical in nature" and do not "result[] from actual operational practice, i.e., where actual daily network operation "in the field" dictates a change in a network parameter." *See, e.g.*, Ex. 1004, 56. Applicant stated that the "actual conditions in the field ... may dictate that enhanced reliability arises from using 50 Hz spacing instead" of 20 Hz spacing. *See, e.g.*, Ex. 1004, 56-57.

50. Applicant then incorrectly argued that *Madebrink* "has no ability to alter any of the proposed changes, i.e., cause a deviation in any such change, based on actual field conditions" because there is no ability to "accommodate[] any deviation to the parameter setting associated with [a] rule based on actual network operation." *See, e.g.*, Ex. 1004, 57-58. As I explain below, *Madebrink* does deviate from a setting based on actual field conditions—the optimization, however, is after the parameter is deployed into the network. *See, e.g.*, §IX.A.

51. Applicant then clarified what it meant by a technically sufficient parameter setting and a "deviation" from that setting. Applicant stated that a technically sufficient parameter setting is "a baseline parameter value" and the deviation is a change in the baseline value that is deduced from actual network operation.

[The rule] involves two distinct components: a technically sufficient parameter setting which effectively provides a baseline parameter value, and a deviation from that value where the extent of the deviation is deduced from actual network operation.

See, e.g., Ex. 1004, 58-59 (italics and underlining added).

52. Applicant next incorrectly argued that *Djoko*’s disclosures “are not directed to verifying network parameters — as the Applicants’ invention is — but rather to ***producing new modified parameter settings*** themselves.” *See, e.g.*, Ex. 1004, 59. Applicant then spent pages arguing that the parameters in *Djoko* are “new.” *See, e.g.*, Ex. 1004, 59-64. Applicant argued that its invention, *unlike Djoko*, is “verifying proposed values for network parameters that are ***already in use*** in a communication system.” *See, e.g.*, Ex. 1004, 64 (italics and bold formatting added). Applicant also argued that its “inventive approach” is to verify “modified parameter settings, particularly for ***existing*** parameters....” *See, e.g.*, Ex. 1004, 64 (italics and bold formatting added).

53. Applicant then argued that *Djoko* “contains no teachings as to how ***existing*** parameters should be verified”; instead, it takes account of operational changes “only when new parameters are proposed and only for those new parameters.” *See, e.g.*, Ex. 1004, 65 (italics and bold formatting added; underlining in original).

54. I disagree with Applicant's characterization of *Djoko*. And, in my opinion, the examiner made a mistake by overlooking the following disclosures about *Djoko*'s expert system 402.

55. The expert system 402 optimizes the system using "many rules" by "*initially* obtain[ing] the knowledge or rules of parameter optimization from human experts," in my opinion this is no different from the baseline technically setting rules in the '705 Patent. *See, e.g.*, Ex. 1007, 13:18-33 (underlining and italics formatting added). After this *initial setting* of parameter values and "as the conditions in the field change, the system will automatically ***change the relevant parameter values*** based on the field data, and ***iteratively evaluate their merits using the simulator.***" *See, e.g.*, Ex. 1007, 13:18-33 (italics and bold formatting added). Therefore, in my opinion, *Djoko*'s disclosures are directed to verifying optimizations to *existing* network parameters — in the same manner as the '705 Patent.

56. *Djoko* teaches "to alter operating parameters of the communication system [] so as to improve and enhance performance of the communication system []." *See, e.g.*, Ex. 1007, 5:50-54.

57. In my *opinion*, *Djoko*'s teachings are akin to those in the '705 Patent. The prosecution history suggests that the Examiner did not recognize that *Djoko* teaches "***adjusting*** operating parameters" such that "the self-engineering

system” functionally “***adjusts*** operating parameters to achieve optimal network performance.” (italics and bold formatting added) *See, e.g.*, Ex. 1007, 6:30-34; 7:38-46 (discussing ***adjusting*** operating parameters); 8:51-57 (explaining that the system “operates upon system parameters to ***adjust*** such parameters”; italics and bold formatting added); 9:51-54 (discussing ***adjusting*** operating parameters).

58. *Djoko* also *explains* that “[o]nce a stable assignment has been achieved, the results are implemented in the wireless communication system and set in place for reevaluations by the self-engineering system.” *See, e.g.*, Ex. 1007, 13:18-35. Specifically, “once the simulator has run, the expert system 402 may evaluate the results [] and determine whether to implement the respective proposed operating parameters.” *See, e.g.*, Ex. 1007, 14:67-15:6 (explaining that the proposed operating parameters are optimized).)

IX. LEVEL OF ORDINARY SKILL

59. I was asked to provide my opinion as to the education and experience of a person of ordinary skill in the art (“POSITA”) of the ’705 patent at the time of the claimed invention, which counsel has informed me to assume to be July 9, 2001, the filing date of the first priority document in the ’705 Patent’s continuity chain. In determining the characteristics of a hypothetical POSITA of the ’705 patent at the time of the claimed invention, I was told by counsel to consider several factors, including the type of problems encountered in the art, the

solutions to those problems, the rapidity with which innovations are made in the field, the sophistication of the technology, and the education level of active workers in the field. I also placed myself back in the time to the time of the claimed invention and considered the professionals with whom I had worked at that time.

60. It is my opinion that a POSITA for the '705 Patent would have had at least a bachelor's degree or an equivalent degree, in electrical engineering or a related field, and two years of experience working with wireless networks, and related technologies. *See, e.g.*, Ex. 1001, generally. More relevant experience could compensate for less education, and vice versa.

61. Based on my education, training, and professional experience in the field of the claimed invention, I possessed the abilities and knowledge of at least a person of ordinary skill in the art at the time of the claimed invention of the '705 Patent. I qualified at least as a person of ordinary skill in the art of the '705 Patent as of its earliest possible priority date (July 9, 2001), because I had a Ph.D. in electrical engineering and at that time I already had over a decade of experience in wireless communications and networking systems. My opinions expressed in this declaration reflect the understanding and knowledge of POSITA at the earliest possible priority date of the '705 Patent (July 9, 2001).

X. CLAIM CONSTRUCTION

62. Based upon my review of the intrinsic record and my experience in the field of wireless networks, I have applied the ordinary and customary meaning of claim terms, consistent with the patent's specification, as would have been understood by a POSITA.

XI. DISCUSSION OF GROUNDS RELATING TO CLAIMS 1-7, 22-26, 28, 29, 31, AND 32 OF THE '705 PATENT

63. It is my opinion that claims 1-7, 22-26, 28, 29, 31, and 32 of the '705 Patent are unpatentable, because they claim features that were known in the art and would have been obvious to a POSITA as of the priority date of the '705 Patent.

A. Ground 1: *Madebrink* in view of *Feuerstein* renders obvious Claims 1-7, 22-26, 28, 31, and 32.

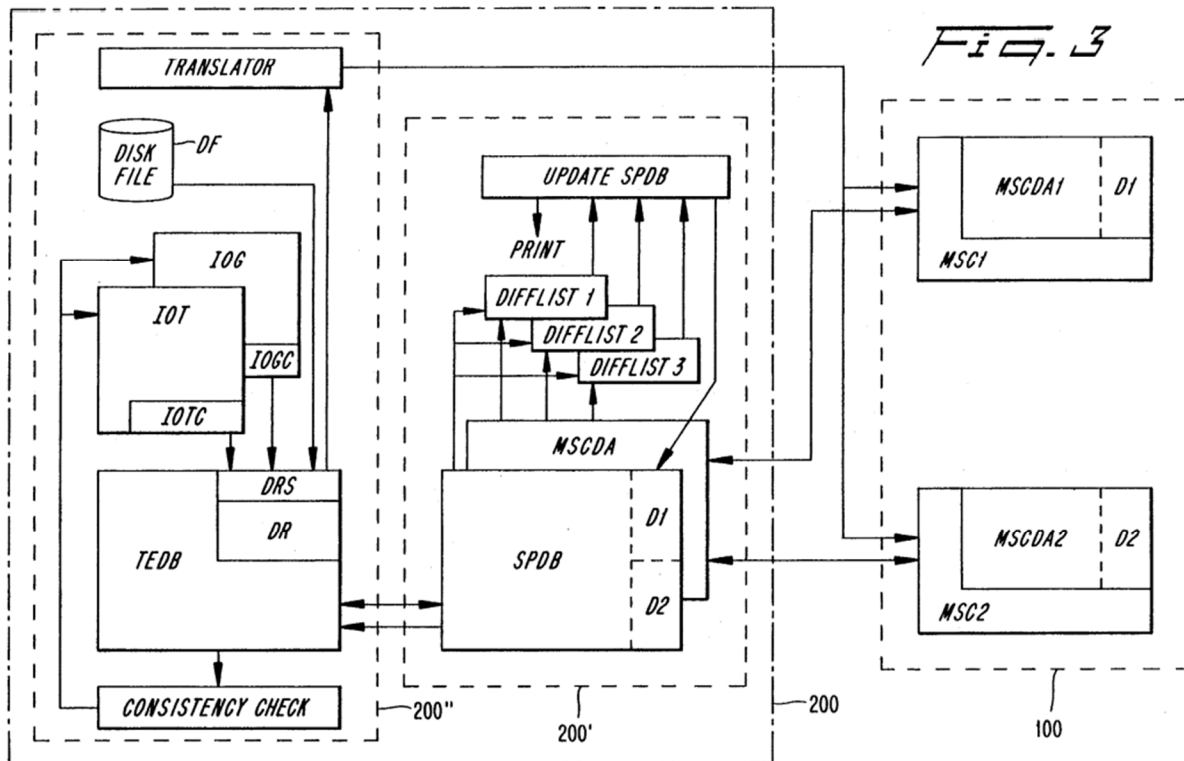
64. In brief, it is my opinion that a person of ordinary skill in the art would have found all elements of claims 1-7, 22-26, 28, 31, and 32 to be obvious over *Madebrink* in view of *Feuerstein*.

Overview of *Madebrink*

65. *Madebrink* discloses a technique for performing reconfiguration of a cellular network. *See, e.g.*, Ex. 1005, Abstract. This technique includes copying cell parameters from an operational network and storing them in a database. *See, e.g.*, Ex. 1005, Abstract. Next, a set of proposed changes to the stored parameters are prepared, and the consistency of the prepared set of proposed

changes is verified. *See, e.g.*, Ex. 1005, Abstract. Any necessary alterations to the set of proposed changes responsive to the verification are made, and the verified set of proposed changes are deployed to the network. *See, e.g.*, Ex. 1005, Abstract.

66. *Madebrink* discloses a database with multiple parts: “the system parameter database SPDB, the buffer MSCDA, and the temporary database TEDB.” *See, e.g.*, Ex. 1005, 7:25-27.



Ex. 1005, Fig. 3.

67. “An updated image of the network is maintained in the SPDB.” *See, e.g.*, Ex. 1005, 7:30-31. To identify actual changes in the network when they occur, *Madebrink* uses “a snap shot buffer memory MSCDA” to register the

“changes, before they are used to update the network image in SPDB.” *See, e.g.*, Ex. 1005, 7:31-37. “The TEDB is a working area in which suggested parameter changes can be introduced while leaving the up-to-date image of the network undisturbed in SPDB, since it may be necessary to refer back to the unchanged image.” *See, e.g.*, Ex. 1005, 7:51-55. “Once the consistency of the proposed changes has been verified, the changes are introduced into the network from the TEDB....” *See, e.g.*, Ex. 1005, 7:55-57.

68. To “verify” the modified parameters, *Madebrink* discloses using a computer program described as a “CONSISTENCY CHECK” that “is a program which performs the verification tests on the entered suggested changes.” *See, e.g.*, Ex. 1005, 10:35-37; 3:39-41. “The CONSISTENCY CHECK routine performs” numerous checks including checking “frequency allocations for the control and voice channels,” “the cells’ power level parameters,” “hand-off and locating thresholds,” etc. *See, e.g.*, Ex. 1005, 13:16-59. The checks are against “known rules.” *See, e.g.*, Ex. 1005, 13:16-59.

Overview of *Feuerstein*

69. *Feuerstein* discloses techniques for optimizing network operation by adjusting “network parameters” based “on monitored network conditions.” *See, e.g.*, Ex. 1006, Abstract. *Feuerstein* calculates “optimum network parameters” by simulating an “*adjustment* of various network parameters ... based on real-time

optimization paradigms which take into consideration not only conditions throughout the network, but also cascading effects caused by adjusting network parameters at particular network elements.” *See, e.g.*, Ex. 1006, 12:28-36.

70. Much like the ’705 Patent’s problem description, *Feuerstein* discloses that it was a common practice “to fix network parameters at the time the network is deployed,” so the parameters were selected “to achieve an acceptable compromise between conditions from all the varying traffic conditions that may be experienced in the network.” *See, e.g.*, Ex. 1006, 1:53-58. “As such, the selection of parameters involve[d] tradeoffs in performance and are not optimized for each geographic area or every given time of day or traffic loading condition that may exist.” *See, e.g.*, Ex. 1006, 1:58-61.

71. This performance tradeoff is a similar problem described by the ’705 Patent where technically sufficient requirements (baseline parameter values) are used, e.g., using a channel distance of 20Hz instead of an optimized channel distance of 50Hz. *See, e.g.*, Ex. 1001, 2:40-45; 6:4-17. As *Feuerstein* explains, this approach “yields a static type network plan” and “does not take into account varying traffic conditions and varying interference conditions that the network will be subject to on a daily or hourly basis.” *See, e.g.*, Ex. 1006, 1:61-65; 6:9-50.

72. The network parameters in *Feuerstein* are “initially provided” for “expected conditions, such as times of day, interference levels,” etc., thereafter,

“these network parameters may be updated as the network is modified....” *See*, e.g., Ex. 1006, 11:50-58. This means that the parameters are initially provided to meet at least a technically sufficient parameter setting requirement, and after that, the parameters are adjusted/modified as the network conditions change.

73. For example, the base station’s “power control parameters such as thresholds, target settings, operating ranges and the like” may be “initially provided” for expected conditions and then adjusted based on real-world operating conditions. *See*, e.g., Ex. 1006, 2:60-4:2; 11:50-58, 12:1-39. Therefore, *Feuerstein* also teaches to optimize a parameter setting (deviate from the technically sufficient parameter setting) where the extent of the deviation is deduced from a simulation that considers conditions throughout the network² and if operational practice

² Ex. 1006 at 3:55-4:2 (“As such, the database of network parameters preferably includes various permutations corresponding to special events, for example, vehicular traffic jams that reoccur at particular locations, sporting events, and other vehicular or user traffic anomalies that cause predictable or surmisable changes in the communication traffic patterns in the cellular network. The database or look-up table, including such updates, is referenced so that, at any given time, the status of the network is taken into account and the best setup parameters are always sent to network elements in various parts of the network.”); *id.* at 12:1-39 (“Accordingly, the database of network parameters includes various permutations corresponding to events experienced in the network. Such a system provides a knowledge base which is constantly updated to meet the conditions actually experienced in operation.... Optimization of the network parameters may be accomplished through the use of a knowledge base providing communication goals, such as particular ranges of operation conditions sought, in addition to operating conditions affected

experience reveals a different more preferable technical parameter setting. After the parameters are optimized and simulated, they are communicated to the network. *Id.* at 12:1-39.

74. By way of another example, the network parameters may be initially provided, i.e., satisfy a technically sufficient rule, and as “special events, for example, vehicular traffic jams ..., sporting events” occur and “cause predictable or surmisable changes in the communications traffic patterns” a database is referenced so that “the status of the network is taken into account” and deviations from the initial parameters settings, “the best setup parameters are always sent to the network elements in various parts of the network,” are made. Ex. 1006, 3:55-4:2. In this way, *Feuerstein* discloses to use initial settings, e.g.,

by an adjustment to a particular network parameter. Utilizing this information, control processor 202 may determine optimum network parameters for particular network elements for then existing monitored conditions. ***These optimized parameters may then be communicated to the proper network elements*** ... [The] control processor 202 includes network simulation software in order to provide network modeling. Utilizing such a modeling tool, providing simulation of network conditions upon adjustment of various network parameters, optimization of network parameters, and the associated database updates, may be accomplished based on real-time optimization paradigms ***which take into consideration not only conditions throughout the network***, but also cascading effects caused by adjusting network parameters at particular network elements. Accordingly, network operation simulation is desirable for use in calculating the optimum network parameters according to the present invention.”) (emphasis added).

technically sufficient settings that will pass a consistency check, and to deviate from those settings based on operational practice of the network to provide parameters that are preferable over the initial settings.

75. Before the adjusted parameter (“modified parameter”) is implemented in the network, however, the deviation is checked to ensure that it optimizes the network. Specifically, the adjusted/modified network parameters are simulated using real-world network conditions. The adjusted/modified parameter is verified using the simulation software on the control processor. *See, e.g.*, Ex. 1006, 12:1-39. This simulation verification ensures that the parameter is adjusted optimally. *See, e.g.*, Ex. 1006, 13:1-34.

Combination of *Madebrink* and *Feuerstein*

76. As I explain in more detail below (§XI.A), a POSITA would have been motivated to modify *Madebrink* in view of *Feuerstein*. *Madebrink*, as I discuss in this declaration, teaches to make changes to parameter settings and then check the consistency of those proposed changes using a CONSISTENCY CHECK. Therefore, in my opinion, *Madebrink* teaches to verifying a modified parameter obtained from changing an operational parameter of a component of a radio network.

77. *Madebrink* also teaches to check the modified parameter on the basis of a technically sufficient rule before implementing the modified parameter

in the network. After verifying that the modified parameter complies with the rule, then the parameter is deployed to the network where it can be further optimized based on the network conditions. Thus, *Madebrink* teaches that before the modified parameter is implemented in the network, one should check the modified parameter on the basis of a rule that establishes a technically sufficient parameter setting requirement. The deviation (optimization) from that requirement occurs after the parameter is implemented into the network and the network conditions can be observed.

78. *Feuerstein*, on the other hand, teaches to optimize a parameter using real network data *before* deploying the optimized parameter to the network. Thus, *Feuerstein* teaches that to check the optimized parameter that deviates from a baseline setting where the optimization and checking are the result of simulating the modified parameter using real network data, i.e., the deviation is deduced from the use of the radio network where the network data is collected.

79. In my opinion, a POSITA would have been motivated to modify *Madebrink* in view of *Feuerstein* to include the ability to simulate optimized parameters using real network data before the optimized parameters are deployed to the network, as *Feuerstein* teaches. Ex. 1006, 12:1-39. Modifying *Madebrink* to include the ability to simulate parameters for optimization purposes would

beneficially allow for optimization *before* activation of the parameter in the network.

80. *Madebrink* teaches to “optimize the newly changed parameters” *after* “the modifications have been made” and “the updated parameters are activated within the network.” Ex. 1005, 11:64-68. While this allowed “live traffic measurements” to “be taken” to “optimize the cell parameters” and make “further changes ... responsive to the optimization,” a POSITA would have found it desirable to optimize the parameter using traffic data in a simulator like *Feuerstein* teaches *before* the parameter is deployed to the network. Ex. 1005, 12:1-4. Doing so would have reduced the efforts involved in activating and deactivating the parameters in the network to optimize the parameter. In the combined system, the simulator checks the optimized parameter before the optimized parameter is implemented in the network. The checking would be similar to *Madebrink*’s CONSISTENCY CHECK, which looks to see whether the optimized parameter is violating a baseline rule, but it also would allow for deviations from that baseline setting based on the simulation of the radio network using traffic data from operational practice, e.g., sporting events or traffic jams associated with the network, to ensure that the system is, in fact, optimized. Assuming that the checking reveals that the baseline rule is satisfied and the parameter does result in an optimization, then the system would save the optimized parameter into the

actual network such that subsequent network operation will respond to the optimized parameter.

1. Claim 1

- a) **[1pre]. A method for verifying a modified parameter obtained from changing an operational parameter of a component of a radio network, the method comprising the steps of:**

81. I have been informed by counsel that, as a matter of law, the preamble may or may not limit the scope of the claims. To the extent the preamble is deemed limiting, it is my opinion that a POSITA would have understood that *Madebrink* teaches, or at least renders obvious, this limitation because it is directed to a method for verifying a modified parameter obtained from changing an operational parameter of a component of a radio network.

82. The '705 patent admits that *Madebrink* teaches “a reconfiguration method and apparatus in which the cell parameters of particular mobile switching centres in a network are copied to a database” where a “set of proposed changes to the stored parameters is prepared, and the consistency of the prepared set of proposed changes is verified.” *See, e.g.*, Ex. 1001, 1:56-63.

83. To “verify” the modified parameters, *Madebrink* teaches using a computer program described as a “CONSISTENCY CHECK” that “is a program which performs the verification tests on the entered suggested changes.” *See, e.g.*, Ex. 1005, 10:35-37; 3:39-41. Once the consistency of the proposed changes has

been verified, the changes are introduced into the network from the TEDB....” *See, e.g.,* Ex. 1005, 7:55-57.

84. A POSITA would have recognized this as an example of verifying a modified parameter (proposed changes) obtained from changing an operational parameter (stored cell parameters copied from the network).

- b) **[1a] before the modified parameter is implemented in the network, checking the modified parameter on the basis of a rule so as to yield a result, said rule comprising both a technically sufficient parameter setting requirement and a deviation from the setting requirement based on an operational requirement deduced from use of the radio network; and**

85. It is my opinion that a POSITA would have understood that *Madebrink*, in view of *Feuerstein*, teaches, or at least renders obvious, this limitation.

86. The claimed rule is checked *before* the parameter being modified is implemented in the network. The rule includes both (1) a technically sufficient parameter setting requirement and (2) a deviation from the setting requirement based on an operational requirement deduced from use of the radio network. The ’705 patent teaches that *Madebrink*’s rule corresponds to “a technically sufficient parameter setting requirement.” Ex. 1001, 2:36-40 (In *Madebrink*, “[t]he rules used in performing this check originate solely from technical requirements derived from cellular network technology.”).

87. *Madebrink* does not expressly disclose deviating from the technically sufficient parameter setting requirements *before* it is deployed for optimization purposes. Nevertheless, *Madebrink* teaches that optimization can occur after the modified parameter is deployed. *See, e.g.*, Ex. 1005, 11:64-12:4. The “*operator may then choose to optimize the newly changed parameters.*” Ex. 1005, 11:64-68. “[L]ive traffic measurements may be taken which may be used to optimize the cell parameters, and if necessary, further changes may be implemented responsive to the optimization.” Ex. 1005, 12:1-4. Thus, in a case where operational experience reveals a different, more preferable technical parameter setting, as suggested by the second prong of the claimed “rule,” *Madebrink* teaches to deviate from the technically sufficient parameter *after* the parameter is deployed to the network.

88. *Madebrink* is also clear that “[a]dditional checks are possible” within its CONSISTENCY CHECK program. *See, e.g.*, Ex. 1005, 13:27-28. The “thresholds can be set for each check rule which must be surpassed before an inconsistency will be found for that rule.” *See, e.g.*, Ex. 1005, 14:15-17. Therefore, in my opinion, a POSITA would have recognized that the rules are flexible, and it would have been straightforward and obvious to modify *Madebrink* in view of *Feuerstein* and the knowledge of a POSITA to optimize the network parameter settings *before* implementing the modified parameter by a deviating from an initial

setting requirement based on an operational requirement deduced from the use of the radio network.

89. For example, *Feuerstein* teaches to optimize the parameter *before* deploying it into the network by simulating the modified parameter against “then existing monitored conditions,” e.g., real-time traffic information. *See, e.g.*, Ex. 1006, 12:17-39. As I explained above, *Feuerstein* teaches techniques for optimizing network operation by adjusting “network parameters” based “on monitored network conditions.” *See, e.g.*, Ex. 1006, Abstract. *Feuerstein* calculates “optimum network parameters” by simulating an “*adjustment* of various network parameters ... based on real-time optimization paradigms which take into consideration not only conditions throughout the network, but also cascading effects caused by adjusting network parameters at particular network elements.” *See, e.g.*, Ex. 1006, 12:28-36.

90. Given the performance tradeoff problem identified by *Feuerstein* (Ex. 1006, 1:61-65; 6:9-50), a POSITA would have understood that there existed “a need” for “dynamically *adjusting* network parameters” for “a particular portion of the network *based on localized conditions*” before deploying the modified parameters into the actual network. *See, e.g.*, Ex. 1006, 2:15-24; 12:1-39. *Feuerstein* solved that need by using a simulator with “optimized network parameters” for “network elements” so that “the network elements are *dynamically*

adjusted to provide operation as desired.” *See, e.g.*, Ex. 1006, 11:11-25; *see also id.*, 6:64-66. In my opinion, parameter optimization³ by dynamic adjustment is a disclosure of modifying a baseline parameter value by an amount deduced from the network’s radio use, e.g., past sporting events or past traffic jams.

91. The parameter adjustments are also based on the *actual use* of the radio network. Referring to *Feuerstein*’s Figure 2, the “network control system 201 determines network conditions” through “monitoring selected network attributes, such as signal levels, bit error rates, frame error rates, voice quality measurements, data throughput, packet success probabilities, dropped call rates, call origination and/or termination success rates, or the like.” *See, e.g.*, Ex. 1006, 8:61-67; 9:12-23.

³ The adjustable radio network parameters are numerous. *See, e.g.*, Ex. 1006, 8:11-26.

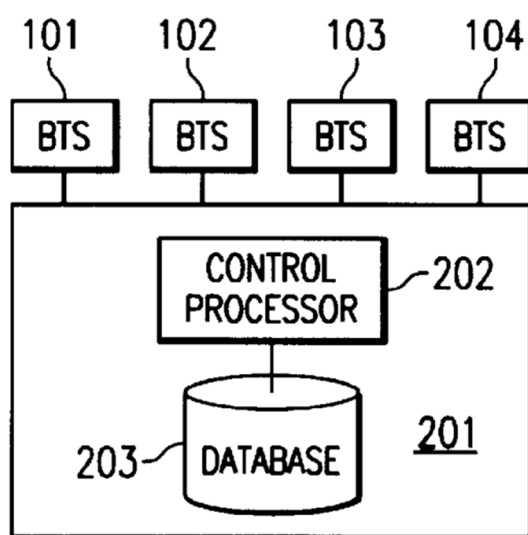


FIG. 2

Ex. 1006, Fig. 2.

92. The network control system 201 is provided with mobile condition information to “have a more robust picture of the conditions within the network when providing network parameters.” *See, e.g.,* Ex. 1006, 9:24-28. “For example, by analyzing conditions experienced within the network, network control system 201 may provide network parameters selected to optimize the network based on such information....” *See, e.g.,* Ex. 1006, 10:9-14-42. Database 203 includes “various permutations corresponding to events experienced in the network,” so it “provides a knowledge base which is constantly updated to meet the conditions actually experienced in operation.” *See, e.g.,* Ex. 1006, 12:1-5.

93. The network parameters may be optimized/adjusted (“modified”) using a “control processor 202” that determines “optimum network parameters for

particular network elements for then existing monitored conditions.” *See, e.g.*, Ex. 1006, 12:17-19.

94. The modified parameter is verified using the control processor. Specifically, the “control processor 202 includes network simulation software” that provides a “simulation of network conditions upon ***adjustment of various network parameters, optimization of network parameters....***” *See, e.g.*, Ex. 1006, 12:26-32. “Accordingly, network operation simulation is desirable for use in calculating the optimum network parameters....” *See, e.g.*, Ex. 1006, 12:37-38. The “optimized parameters ***may then*** be communicated to the proper network elements as well as stored in database 203 for later retrieval when similar conditions are again monitored.” *See, e.g.*, Ex. 1006, 12:20-23.

95. In my opinion, a POSITA would have found it obvious and straightforward to modify *Madebrink* in view of *Feuerstein* to include technically sufficient rule checking, as well as rule checking from operational practice as well. To begin, as I explained previously, *Madebrink* teaches to check a parameter against a baseline setting requirement. And *Feuerstein* teaches to simulate network conditions in response to adjusting various network parameters based on monitored network conditions. *See, e.g.*, Ex. 1006, 12:29-31. A POSITA would have found it desirable to continue ensuring that the baseline requirements are met while also checking whether deviations from those requirements provide an

optimized parameter for a given network condition, e.g., sporting event. In the combined system, the simulation takes into account “conditions throughout the network” to adjust the parameters in an optimum manner. *See, e.g.*, Ex. 1006, 12:31-39.

96. In my opinion, *Feuerstein*’s pre-deployment optimization (*id.*) is similar to *Madebrink*’s after-the-fact optimization based on “live traffic measurements” to “optimizes the cell parameters” and make “further changes,” if necessary (Ex. 1005, 12:1-4). Given that the parameters in *Madebrink* and *Feuerstein* are adjustable and that both references expressly discuss optimizing the parameters based on real-world traffic information, a POSITA would have been motivated to look to *Feuerstein*’s network parameter optimization and simulation techniques to complement *Madebrink*’s network parameter verification techniques. A POSITA reading *Feuerstein* would have instantly recognized that parameter optimization can be achieved in a simulator that considers static rules, like those discussed in *Madebrink*, and deviations from those rules that provide optimizations for certain real-world network conditions, e.g., whether a sporting event is occurring or not, as *Feuerstein* teaches.

97. In *Feuerstein*, similar to *Madebrink*, the adjusted/modified parameter is verified using the simulation software on the control processor. *See, e.g.*, Ex. 1006, 12:26-38. This verification ensures that the parameter is adjusted

optimally, i.e., that it meets not only a technically sufficient parameter setting rule but also deviates from that technically sufficient rule based on the actual use of the radio network to optimize the network. *See, e.g.*, Ex. 1006, 13:1-34.

98. As *Madebrink* explains, programming the “CONSISTENCY CHECK,” which may have additional checks like *Feuerstein*’s optimization simulation, “is a mere mechanical step for a routineer skilled in the art.” *See, e.g.*, Ex. 1005, 13:16-20. Therefore, in my opinion, a POSITA would have found it straightforward and obvious to modify *Madebrink* in view of *Feuerstein*’s disclosure of using a simulator to check the optimized parameter before implementing the modified parameter into the system. Ex. 1006, 12:1-39. Furthermore, such a modification would have been well within the scope of POSITA and would yield predictable results of parameter optimization within a framework of rules. Therefore, *Madebrink* as modified by *Feuerstein* and the knowledge of a POSITA, renders obvious the features of claim element 1a.

- c) **[1b] if the result indicates that the rule has been obeyed, storing the modified parameter in the network such that subsequent network operation will respond to the modified parameter.**

99. In my opinion, *Madebrink* as modified by *Feuerstein* and the knowledge of a POSITA teaches and renders obvious this feature. For instance, as I discussed above, *Madebrink* as modified by *Feuerstein* and the knowledge of a POSITA simulates and verifies the consistency of the proposed parameter changes

against rules that account for technical sufficiency and deviations given the real-world conditions experienced by the network before storing the modified parameters for introduction into the network. *See, e.g.*, Ex. 1005, 7:55-58; Ex. 1006, 9:35-59, 11:50-12:39. When the CONSISTENCY CHECK/simulation is completed “the operator will be informed about the status, which is Execution Completed or Failed.” *See, e.g.*, Ex. 1005, 14:10-12. After the CONSISTENCY CHECK/simulation, the updated/optimized “parameters are activated within the network (step 24).” *See, e.g.*, Ex. 1005, 11:64-65; 7:55-57 (“Once the consistency of the proposed changes has been verified, the changes are introduced into the network from the TEDB....”).) Therefore, in my opinion, *Madebrink* as modified by *Feuerstein* and the knowledge of a POSITA renders obvious the features of claim element 1b.

2. Claim 2

- a) **The method recited in claim 1 wherein the checking step comprises the steps of: copying the operational parameter from the radio network to a database; and changing the operational parameter to the modified parameter.**

100. As I explained previously, the *Madebrink-Feuerstein* combination renders obvious claim 1. In my opinion, *Madebrink* as modified by *Feuerstein* and the knowledge of a POSITA expressly teaches the features of claim 2. During prosecution, Applicant admitted that *Madebrink* “involves copying of

network parameters to a database, changing the copied parameters and verifying the consistency of the proposed changes in a consistency check.” *See, e.g.*, Ex. 1004, 135.

101. Specifically, *Madebrink* teaches “performing reconfiguration of a cellular network including **copying cell parameters of affected mobile switching centers in the network to a database**, and storing the copied parameters, **preparing a set of proposed changes to the stored parameters**, verifying the consistency of the prepared set of proposed changes and making any necessary alterations of the set of proposed changes responsive to the verification, copying the verified set of proposed changes to the affected mobile switching centers, and introducing the verified set of proposed changes into the network.” *See, e.g.*, Ex. 1005, 3:66-4:11 (emphasis added).) Thus, *Madebrink* as modified by *Feuerstein* and the knowledge of a POSITA renders obvious claim 2.

3. Claim 3

- a) **The method recited in claim 2 further comprising the step of generating a non-compliance signal if the modified parameter does not obey the operational requirement.**

102. As I explained previously, the *Madebrink-Feuerstein* combination renders obvious claims 1 and 2. In my opinion, *Madebrink* as modified by *Feuerstein* and the knowledge of a POSITA expressly teaches the features of claim 3. As I discussed above, the combination simulates proposed

parameter optimizations. *Madebrink* further teaches checking whether the modified parameters follow rules before implementing approved changes to the network.

See, e.g., Ex. 1005, 11:15-27. If the parameter modifications generate inconsistencies with rules, then the operator must decide whether to approve the changes or specify additional changes to the proposed parameter modifications. Ex. 1005; *see also* Ex. 1005, 14:8-16 (when the consistency check is completed, “the operator will be informed about the status, that is ***Execution Completed or Failed.***” (italics and bold formatting added)).

103. Informing the operator of a failed check, for example, involves generating a signal, i.e., the “non-compliance signal.” For example, a POSITA would have found it straightforward and obvious to inform the operator of the failed check by creating a “non-compliance signal” and using an audible warning, a visual warning, or both. This concept was well-known in the art. *See, e.g.*, Ex. 1013, 22:62-65 (using a display on the screen, audible warning, or other means to alert a network designer of network errors.) A POSITA would have had no problem informing the operator in the *Madebrink-Feuerstein* combination that the execution failed using a message on a screen or an audible warning. Therefore, in my opinion, *Madebrink-Feuerstein* renders obvious claim 3.

104. To the extent it is found that informing the user of a failed consistency check is not a disclosure of generating a non-compliance signal if the

modified parameter does not obey the operational requirement, it would have been obvious to modify *Madebrink* as modified by *Feuerstein* and the knowledge of a POSITA further to generate a warning signal, e.g., a warning message on the user's computer screen, that the user must review if the modified parameter fails the consistency check, e.g., does not obey an operational requirement such as an acceptable threshold range for the modified parameter. Ex. 1005, 14:8-16. It was obvious at the time of the alleged invention to issue a visual warning in response to a failure, such as a consistency check failure. Adding such a visual warning to inform the user of the failure would have required nothing more than routine skill in the art and would have been straightforward, routine, and conventional to a POSITA.

4. Claim 4

- a) **The method recited in claim 3 wherein the non-compliance signal is a file or message displayed to an operator.**

105. As I explained previously, the *Madebrink-Feuerstein* combination renders obvious claims 1, 2, and 3. In my opinion, *Madebrink* as modified by *Feuerstein* and the knowledge of a POSITA expressly teaches the features of claim 4. *Madebrink*. See my citations and analysis for claim 3, which I incorporate here by reference.

5. Claim 5

- a) **The method recited in claim 3 wherein the non-compliance signal is programmable.**

106. As I explained previously, the *Madebrink-Feuerstein* combination renders obvious claims 1, 2, and 3. In my opinion, *Madebrink* as modified by *Feuerstein* and the knowledge of a POSITA expressly teaches the features of claim 5.

107. As I explained in my discussion of claim 3, a POSITA would have found it obvious to inform the user that the consistency check failed using an audible warning, a visual warning, or both. Ex. 1005, 14:8-16. Adding such a warning to inform the user of the failure would have required nothing more than routine skill in the art and would have been straightforward, routine, and conventional to a POSITA. The choice of whether the warning is audible or visual is a programmable feature. And a POSITA would have readily understood that specifying how a warning is provided is an example of programming the non-compliance signal.

6. Claim 6

- a) **The method recited in claim 2 further comprising the steps of: storing the operational parameter in a first part of the database; and storing the modified parameter in a second part of the database.**

108. As I explained previously, the *Madebrink-Feuerstein* combination renders obvious claim 1. In my opinion, *Madebrink* as modified by

Feuerstein and the knowledge of a POSITA expressly teaches or renders obvious the features of claim 6. As I discussed above for claim 2, *Madebrink* as modified by *Feuerstein* and the knowledge of a POSITA, copies cell parameters, stores the copied parameters, and makes changes to those copied parameters for verification purposes. *See, e.g.*, Ex. 1005, 3:66-4:11. Once the parameter changes are verified, they are copied and introduced into the network.

109. In more detail, the *Madebrink-Feuerstein* includes a system 200 having an up-to-date image of the cellular network stored in a system parameter database SPDB (“first part of the database”) and a proposed image of the cellular network with modified parameters stored in a temporary database TEDB (“a second part of the database”). Ex. 1005, 7:25-29)

110. The SPDB stores the current operational parameters of the network. *See, e.g.*, Ex. 1005, 7:30-50. The TEDB is a working area in the database in which suggested parameter changes can be introduced while leaving the current (unmodified) image of the network parameters undisturbed in the SPDB, since it may be necessary to refer back to the unchanged parameters. Ex. 1005, 7:51-55; *see also* Ex. 1005, 9:50-60. “Once the consistency of the proposed changes has been verified, the changes are introduced into the network from the TEDB....” Ex. 1005, 7:55-57.

111. To the extent that Patent Owner contends that the above-mentioned database with two parts: SPDB and TEDB is really two separate databases and therefore not “a database” as claimed, Petitioner directs the Board’s attention to claim 7, which depends from claim 6 and requires that “the first and second parts of the database are separate databases.” Ex. 1001, cl. 7.

112. Given that claim 7 depends from claim 6, I am informed that the scope of claim 6 includes the scope of claim 7. Therefore, claim 6 must include separate databases within its scope.

7. Claim 7

- a) **The method recited in claim 6 wherein the first and second parts of the database are separate databases.**

113. As I explained previously, the *Madebrink-Feuerstein* combination renders obvious claims 1, 2, and 6. In my opinion, *Madebrink* as modified by *Feuerstein* and the knowledge of a POSITA expressly teaches and renders obvious the features of claim 7 for the same reasons as those discussed above for claim 6, which I incorporate here by reference.

8. Claim 22

- a) **[22pre] A system for verifying a modified parameter obtained from changing an operational parameter of a component of a radio network, wherein the system comprises:**

[22a] a rule checker which, before the modified parameter is implemented in the network, checks the modified parameter on the basis of a rule so as to yield a result, said rule comprising both a technically sufficient parameter setting requirement and a deviation from the setting requirement based on an operational requirement deduced from use of the radio network; and

[22b] a data transferrer which, if the result indicates that the rule has been obeyed, stores the modified parameter in the network such that subsequent network operation will respond to the modified parameter.

114. In my opinion, *Madebrink* as modified by *Feuerstein* and the knowledge of a POSITA renders obvious this claim for the same reasons as those discussed above for claim 1. I am incorporating here that discussion by reference. Additionally, the *Madebrink-Feuerstein* system that performs the method described in claim 1 is the system in claim 22. The programmed computer in the *Madebrink-Feuerstein* system performs rule checking, so a POSITA would have understood that the system must have a “rule checker,” and that it transfers optimized parameters to the network, so it must include a “data transferrer.”

9. Claim 23

- a) **The system recited in claim 22 further comprising: a first part of a database for storing the operational parameter from the radio network; and a second part of the database for storing the modified parameter.**

115. As I explained previously, the *Madebrink-Feuerstein* combination renders obvious claims 1, 2, 6, and 22. In my opinion, *Madebrink* as modified by *Feuerstein* and the knowledge of a POSITA expressly teaches and renders obvious the features of claim 23 for the same reasons discussed above for claim 6. I am incorporating that discussion here by reference.

10. Claim 24

- a) **The system recited in claim 23 further comprising a signal generator which generates a non-compliance signal if the modified parameter does not obey the operational requirement.**

116. As I explained previously, the *Madebrink-Feuerstein* combination renders obvious claims 1, 2, 3, 22, and 23. In my opinion, *Madebrink* as modified by *Feuerstein* and the knowledge of a POSITA expressly teaches and renders obvious the features of claim 24 for the same reasons discussed above for claim 3. I am incorporating that discussion here by reference.

11. Claim 25

- a) **The system recited in claim 23 further comprising scripting means which define rules and/or error messages that are to be used by the rule checker.**

117. As I explained previously, the *Madebrink-Feuerstein* combination renders obvious claims 1, 2, 6, 22, and 23. In my opinion, *Madebrink* as modified by *Feuerstein* and the knowledge of a POSITA renders obvious the feature of claim 25. I reviewed the '705 patent's specification, and it does not disclose a "scripting means" anywhere other than claim 25. It does disclose, however, that business rule is a "script" and that it can be called by running a main script. Ex. 1001, 4:57-58; 6:19-21; 7:18-20; 7:50-8:11.

118. Given this context, it appears that the "scripting means" is a computer program that defines the rules and error messages used by the verification program. *Madebrink* as modified by *Feuerstein* and the knowledge of a POSITA teaches a simulator and consistency check program that defines the rules used by the simulator/consistency checker and provides an indication to the user when there has been a failure. Programming these rules and warning messages would have been straightforward and obvious to a POSITA and *Madebrink* explains that doing so is a mere "mechanical step for a routineer skilled in the art." See, e.g., Ex. 1005, 12:17-20; 13:16-25; 14:5-16. Therefore, *Madebrink* as modified by *Feuerstein* and the knowledge of a POSITA renders obvious claim 25.

12. Claim 26

- a) **26. A radio network comprising a component having an operational parameter that can be changed to a modified parameter, the network comprising:**

a rule checker which, before the modified parameter is implemented in the network, checks the modified parameter on the basis of a rule so as to yield a result, said rule comprising both a technically sufficient parameter setting requirement and a deviation from the setting requirement based on an operational requirement deduced from use of the radio network; and

a data transferrer which, if the result indicates that the rule has been obeyed, stores the modified parameter in the network such that subsequent network operation will respond to the modified parameter.

119. In my opinion, *Madebrink* as modified by *Feuerstein* and the knowledge of a POSITA renders this claim obvious for the same reasons as those discussed above for claim 1, which I incorporate here by reference. Additionally, the *Madebrink-Feuerstein* system that performs the method described in claim 1 is deployed in a radio network, which corresponds to the radio network of claim 26. The programmed computer in the *Madebrink-Feuerstein* system performs rule checking, so a POSITA would have understood that the system must have a “rule checker,” and that it transfers optimized parameters to the network, so it must include a “data transferrer.”

13. **Claim 28**

- a) **28. A computer program recorded on a computer readable media and containing computer executable instructions for execution on a computer system, the program comprising software code portions for verifying a modified parameter obtained from changing an operational parameter of a component of a radio network, wherein the instructions when executed cause the computer to:**

check, before the modified parameter is implemented in the network, the modified parameter on the basis of a rule so as to yield a result, said rule comprising both a technically sufficient parameter setting requirement and a deviation from the setting requirement based on an operational requirement deduced from use of the radio network; and

if the result indicates that the rule has been obeyed, store the modified parameter in the network such that subsequent network operation will respond to the modified parameter.

120. In my opinion, *Madebrink* as modified by *Feuerstein* and the knowledge of a POSITA renders this claim obvious for the same reasons as those discussed above for claim 1, which I incorporate here by reference. Moreover, *Madebrink* as modified by *Feuerstein*, and as based on the knowledge of a POSITA, would include a computer program product. *See, e.g.*, Ex. 1005, 6:24-43. Additionally, the *Madebrink-Feuerstein* method described in claim 1 is performed by a programmed computer. The programmed computer is an example of the computer program stored (recorded) on a computer-readable media as required by claim 26.

14. Claim 29

- a) **29. The computer program recited in claim 28 wherein the instructions, when executed, further cause the computer to:**

copy the operational parameter from the radio network to a database; and

change the operational parameter to the modified parameter.

121. As I explained previously, the *Madebrink-Feuerstein* combination renders obvious claim 28. In my opinion, *Madebrink* as modified by *Feuerstein* and the knowledge of a POSITA renders the feature of claim 29 obvious for the same reasons as those discussed above for claim 3, which I incorporate here by reference. Additionally, the *Madebrink-Feuerstein* method described in claim 3 is performed by a programmed computer. It would have been obvious to POSITA that a programmed computer includes computer program recorded on a computer-readable media, and that the computer program performs the claimed steps in claim 29.

15. Claim 31

- a) **A data carrier having a computer program recorded thereon, the program containing computer executable instructions for execution on a computer system, the program comprising software code portions for verifying a modified parameter obtained from changing an operational parameter of a component of a radio network, wherein the instructions when executed cause the computer to:**

check, before the modified parameter is implemented in the network, the modified parameter on the basis of a rule so as to yield a result, said rule comprising both a technically sufficient parameter setting requirement and a deviation from the setting requirement based on an operational requirement deduced from use of the radio network; and

if the result indicates that the rule has been obeyed, store the modified parameter in the network such that subsequent network operation will respond to the modified parameter.

122. In my opinion, *Madebrink* as modified by *Feuerstein* and the knowledge of a POSITA renders this claim obvious for the same reasons as those discussed above for claims 1 and 28, which I incorporate here by reference. It would have been obvious to POSITA that the programmed computer includes a computer program recorded on a data carrier, such as a hard drive.

16. Claim 32

- a) **The data carrier recited in claim 31 wherein the instructions, when executed, further cause the computer system to:**

copy the operational parameter from the radio network to a database; and

change the operational parameter to the modified parameter.

123. As I explained previously, the *Madebrink-Feuerstein* combination renders obvious claim 31. In my opinion, *Madebrink* as modified by *Feuerstein* and the knowledge of a POSITA renders the feature of claim 32 obvious for the same reasons as those discussed above for claim 6, which I incorporate here by reference.

B. Ground 2: *Madebrink* in view of *Feuerstein* and *Shipman* Renders Obvious Claims 1-7, 22-26, 28, 29, 31, and 32.

124. I am informed by counsel that the patent owner may argue that *Madebrink* in view of *Feuerstein* does not render obvious a rule that includes “a deviation from the setting requirement based on an operational requirement deduced from use of the radio network” as recited by independent claim 1 (and somewhat similarly recited by independent claims 22, 26, 28 and 31). If the patent owner makes such an argument, I disagree for the reasons discussed above. As I detail below, however, such a feature would have been obvious to POSITA in view of additional disclosures by *Shipman*.

125. *Shipman* explains that it was well-known to optimize a network using an expert system that uses “technically sufficient rules” and variations of those rules, i.e., deviations of the rules, where those deviations are deduced based on operational requirements, e.g., improved connectivity, from data obtained by using the network itself.

126. Specifically, *Shipman* describes an earlier system that network optimization systems include the ability to modify a network “in accordance with user preferences and predetermined traffic requirements, using a knowledge base of rules.” Ex. 1010, 1:15-18. This is similar to the baseline rules and initial settings used in *Madebrink*, as I discussed above.

127. In those same earlier systems, the “rules from the knowledge base [were] used to select different categories of modification that may be made to the baseline architecture, at the same time satisfying the user preferences, and a network simulator simulate[d] operation and performance of modified networks in each category according to the predetermined traffic requirements.” Ex. 1010, 1:18-22. “Particular modification options in one or more categories [were] then selected using rules from the knowledge base, taking account of performance results from the network simulations and the user preferences.” Ex. 1010, 1:22-25. “Further simulation of each of the selected modification options is then used to assess their performance and cost relative to the performance and cost of the

baseline architecture and so produce a ranked list of options for a modified network architecture.” Ex. 1010, 1:15-28.

128. *Shipman* explains that “while a great deal of experience may be embodied a knowledge base of rules for use in such systems, the resultant options for modification of a network are nevertheless limited by the rule set used to devise them.” Ex. 1010, 1:29-31. *Shipman* overcame this problem by utilizing a simulation tool that includes a rule store, e.g., a database of technically sufficient rules, a rule generator, e.g., software that receives rules from the rule store and generates variations of those rules, and a simulator that simulates modified parameter settings, which satisfy the variable rules, against real network data. Ex. 1010 at 7:5-8; 8:5-14.

129. As explained in *Shipman*’s Abstract, it was known to take a “set of traffic handling requirements” where each “rule includes a condition portion and an action portion, and at least one such rule includes a portion expressed in terms of at least one variable parameter.” Ex. 1010, 21:5-9. In plain language, *Shipman* teaches a rule including a baseline technical setting (if x, then y; i.e., the condition action that I discussed above) and a deviation from that setting (a variable parameter). The variable parameter within a rule uses weighting parameters to generate “subtle variations,” i.e., deviations, to a rule. Ex. 1010, 3:29-33. By varying the network design rules, certain types of network modification that may

not have been possible with a fixed rule set may be considered, potentially leading to a particularly successful network design. Ex. 1010, 3:5-7.

130. As I detailed previously, *Madebrink* teaches to use additional checks within the CONSISTENCY CHECK program. *See, e.g.*, Ex. 1005, 13:27-28. Similarly, *Feuerstein* teaches to optimize the parameter *before* deploying it into the network by simulating the modified parameter against real-time traffic information. *See, e.g.*, Ex. 1006, 12:29-39. Given the disclosures of *Shipman* and the knowledge of a POSITA, a POSITA would have found it straightforward and obvious further to modify *Madebrink* as modified by *Feuerstein* and the knowledge of a POSITA in view of *Shipman* such that the consistency check is performed not only on baseline technically sufficient rules, but also on deviations of those rules that during simulations using real traffic data revealed a particularly successful design.

131. As *Madebrink* explains, programming the “CONSISTENCY CHECK,” which may have additional checks like *Feuerstein*’s optimization simulation, “is a mere mechanical step for a routineer skilled in the art” and *Shipman*’s varied rules that were shown to be particularly successful during simulations. *See, e.g.*, Ex. 1005, 13:16-20; Ex. 1010, 3:5-7. Therefore, in my opinion, a POSITA would find it straightforward and obvious to modify *Madebrink* in view of *Feuerstein* and *Shipman* to use a simulator to check the

modified parameter based on a rule with a technically sufficient parameter setting requirement and a deviation from the setting requirement based on an operational requirement deduced from use of the radio network and that this checking is performed before implementing the modified parameter into the system. Ex. 1006, 12:1-39. Therefore, *Madebrink as modified in view of Feuerstein, Shipman, and the knowledge of a POSITA* discloses the features of the independent claims that I have been informed by counsel that patent owner may argue are missing from the *Madebrink-Feuerstein* combination.

132. The additional challenged claims in ground 1 (claims 2-7, 23-25, 29, and 32) are obvious for substantially similar reasons as those discussed above for Ground 1. In other words, modifying *Madebrink* as modified by *Feuerstein* and the knowledge of a POSITA to include *Shipman*'s explicit disclosure of a rule deviation to the simulation check does not affect the analysis for these additional claims. Therefore, in my opinion, claims 2-7, 23-25, 29, and 32 are obvious in view of *Madebrink* as modified in view of *Feuerstein, Shipman*, and the knowledge of a POSITA.

C. Ground 3: *Djoko* anticipates Claims 1, 22, 26, 28, and 31.

1. Claim 1

- a) [1pre]. A method for verifying a modified parameter obtained from changing an operational parameter of a component of a radio network, the method comprising the steps of:

133. In my opinion, *Djoko* discloses this feature and is not limited to producing “new” parameters, as Applicant argued during prosecution. *See, e.g.*, Ex. 1004, 59-64. *Djoko* also discloses “adjusting” and “altering” *existing* parameters.

134. *Djoko* discloses a “self-engineering system 100” that “interacts with [a] communication system 102 to *alter operating parameters* of the communication system 102 so as to improve and enhance performance of the communication system 102.” *See, e.g.*, Ex. 1007, 5:50-54 (emphasis added). The communication system 102 is shown in Fig. 2 and includes radio network infrastructure. Ex. 1007, 7:10-25; Fig. 2.

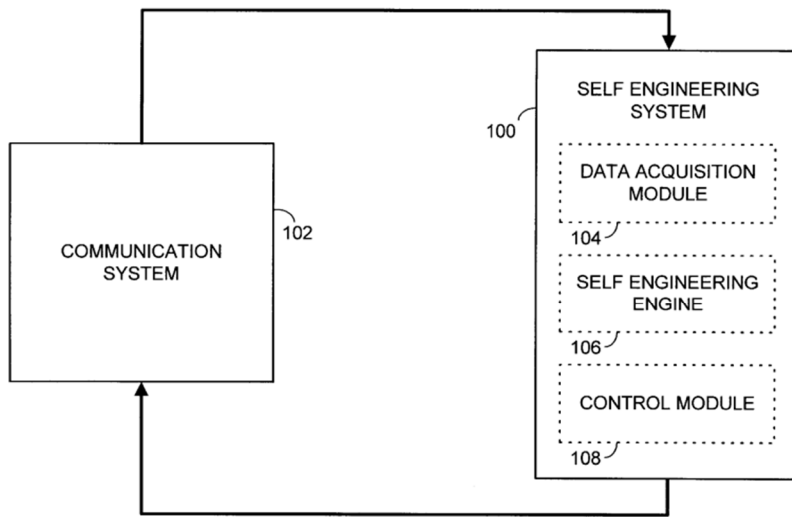
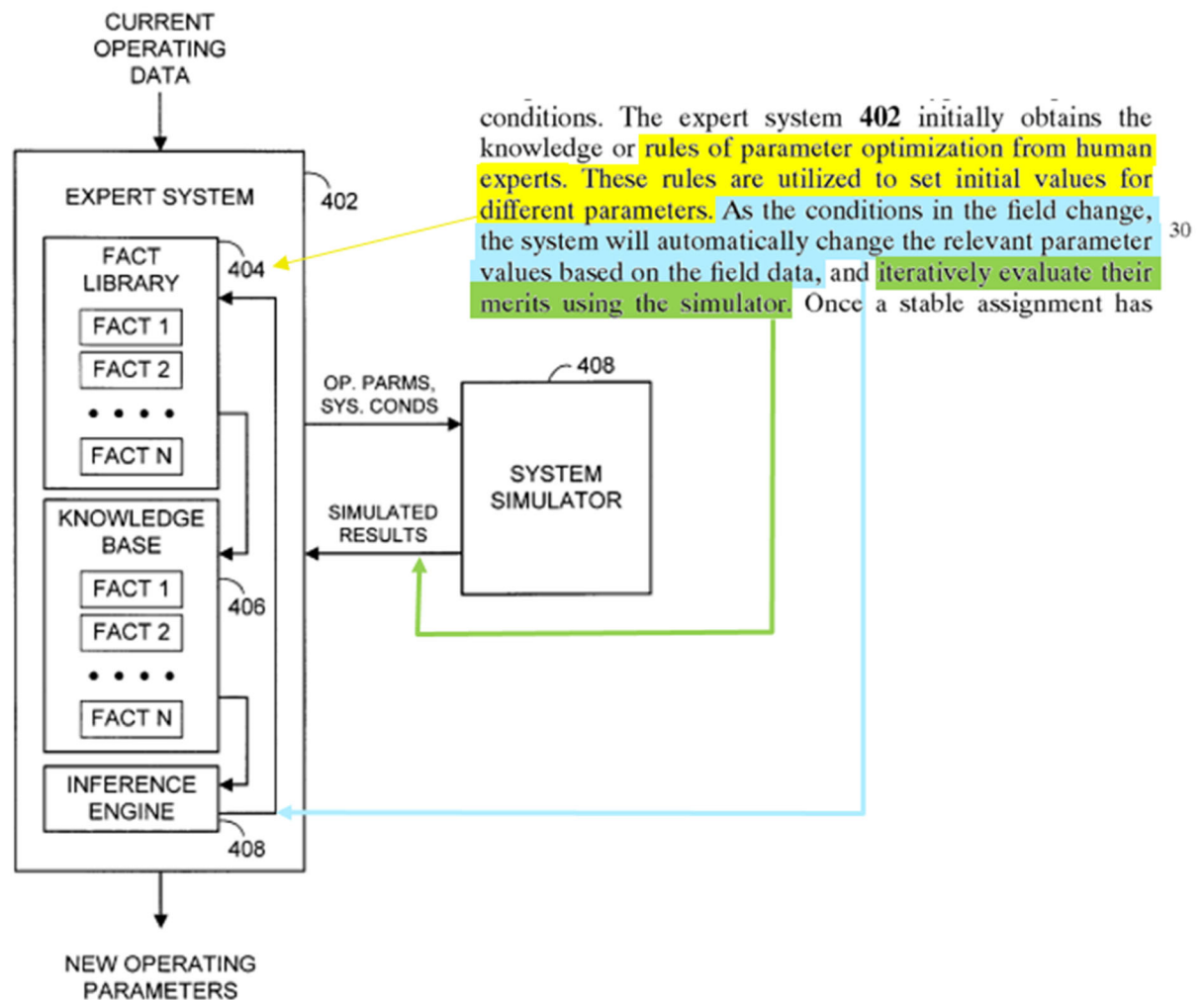


FIG. 1

Ex. 1007, Fig. 1.

135. “Functions of the self-engineering system 100 include... *parameter adjustment*....” Ex. 1007, 6:21-23 (emphasis added). “In adjusting operating parameters, the self-engineering system 100 analyzes operational measurements against pre-defined system performance metrics and *adjusts operating parameters* to achieve optimal network performance.” Ex. 1007, 6:30-34 (italics and bold formatting added).

136. *Djoko*’s self-engineering engine 106 includes a “simulator,” which aids in a “fast system parameter *adjustment* process.” Ex. 1007, 6:41-47. “FIG. 4 illustrates a particular construction of the self-engineering engine previously described as reference numeral 106 in FIG. 1,” and includes “an expert system 402” and a “system simulator 408.” Ex. 1007, 10:9-13.)



Ex. 1007, Fig. 4 (annotated); 13:26-32. The expert system is a programmed computer that uses rules to set technically sufficient values for different parameters. Ex. 1007, 13:26-29. As the conditions in the field change, the system proposes changes to the *existing* parameter values based on the field data from the actual usage of the network. Ex. 1007, 13:29-31. The proposed changes to the *existing* parameter values are iteratively evaluated using the simulator. Ex. 1007, 13:31-32.

137. *Djoko* describes an example where “after the wireless communication system has been installed for some time, the geographic area served changes as does the load served by the system.” Ex. 1007, 12:9-12. In this example, “both the mobility and number of units being served has changed as has the RF propagation within the area served by the wireless communication system,” so “operating parameters that previously provided satisfactory performance no longer do so.” Ex. 1007, 12:12-21. Therefore, in my opinion, “[o]ne particular set of parameters that needs to be *altered* as the wireless communication system changes relate to handoff.” Ex. 1007, 12:21-23 (emphasis added).

138. Prior to *Djoko*’s system, “[h]andoff parameter optimization [was] performed by experienced engineers and [did] not lend itself to easy automation.” Ex. 1007, 13:19-20. But, with *Djoko*’s system, automation became possible. Specifically, “the expert system 402, simulator 408 and interface to the wireless operational measurements and logs from the wireless communication system allow handoff to be optimized and simulated by the self-engineering system.” Ex. 1007, 13:20-23.

139. While the parameters are initially optimized using rules from human experts, i.e., technically sufficient rules, as “the conditions in the field change, the system will automatically change the relevant parameter values based

on the field data, and iteratively evaluate their merits using the simulator.” Ex.

1007, 13:23-32. This is a “deviation” from the technically sufficient rule.

140. “Once a stable assignment has been achieved the results are implemented in the wireless communication system and set in place for reevaluations by the self-engineering system.” *See, e.g.*, Ex. 1007, 13:32-35. Achieving a stable result in the simulator is an example of “verifying a modified parameter obtained from changing an operational parameter of a component of a radio network.” Therefore, in my opinion, *Djoko* discloses verifying an adjusted parameter (“modified parameter”) using a simulator where that modified parameter is obtained from changing an operating parameter (“operational parameter”) of a component of a radio network, such as the component that performs handoff in the network, (“a component of a radio network”).

- b) **[1a] before the modified parameter is implemented in the network, checking the modified parameter on the basis of a rule so as to yield a result, said rule comprising both a technically sufficient parameter setting requirement and a deviation from the setting requirement based on an operational requirement deduced from use of the radio network; and**

141. In my opinion, *Djoko* discloses this feature. For instance, as detailed above for claim element [1pre], *Djoko* discloses that before the adjusted parameter (“modified parameter”) is implemented in the communication system

(“network”), the system simulator verifies (“checks”) the adjusted parameter before it is implemented into the system. Ex. 1007, 13:18-37.

142. The verification by the simulator utilizing the current operating data of the communication network is a verification that the altered parameters “will improve the operation of the communication system.” Ex. 1007, 3:40-46. This verification is performed by considering a multipronged rule, such as the one claimed by the ’705 Patent. Specifically, the verification of the rule includes both a check of whether the adjusted parameter satisfies a baseline rule and a deviation from that baseline rule, which is based on the actual use of the radio network. Referring to Fig. 4, the expert system 402 includes a fact library 404. *See, e.g.*, Ex. 1007, 10:31-32. “The fact library 404” includes “historical operating data” and “current operating parameters.” Ex. 1007, 10:36-40. “The expert system 402 initially obtains the *knowledge or rules of parameter optimization from human experts*. These rules are utilized to set initial values for different parameters.” Ex. 1007, 13:26-29. This is an example of the claimed “rule,” including “a technically sufficient parameter setting requirement.” This type of rule can be found in documents, although it “is often not found in documents but comes from the experience, rules of thumb and judgment of humans working in the domain.” Ex. 1007, 10:19-23. For example, the threshold setting requirement rule/setting can be “acquired from engineers.” *See, e.g.*, Ex. 1007, 13:45-46; *see also* Ex. 1007, 14:42-

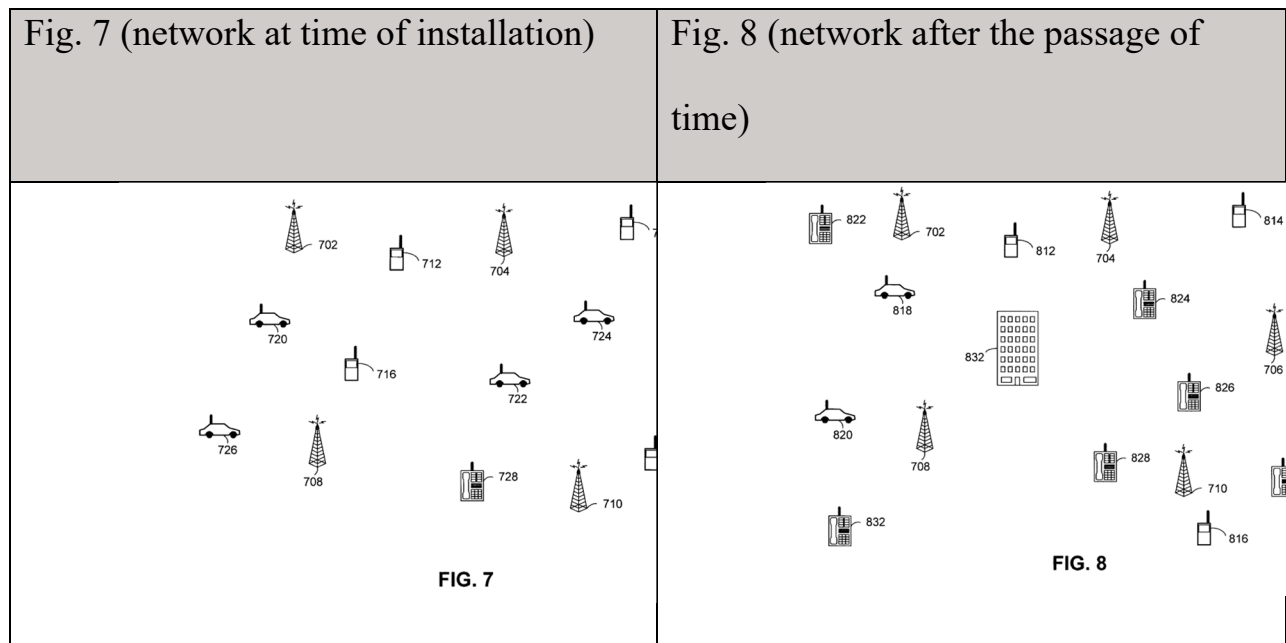
43. Therefore, in my opinion, the knowledge from human experts/documents can also correspond to the claimed rule that includes “a technically sufficient parameter setting requirement.”

143. Experience from daily operational use of the communication system can reveal a different optimized parameter setting. *Djoko* teaches that the rules can be altered according to knowledge obtained from the daily operational use of the communication system. *See, e.g.*, Ex. 1007, 3:59-62 (“In operating on a portion of the communication system, each self-engineering module operates on a subset of ***all system parameters that may be altered*** by the self-engineering system.”(italics and bold formatting added)); 5:50-54 (discussing altering “operating parameters of the communication system 102 so as to improve and enhance performance of the communication system 102”).

144. In *Djoko*, parameters are adjusted/modified in response to triggering events. Referring to Fig. 6, “the self-engineering system monitors operation of the communication awaiting a triggering event.” Ex. 1007, 11:32-34. A triggering event occurs by operator intervention or “when the system fails to reach a predetermined level of operation.” Ex. 1007, 11:14-20. “When the triggering event is met” (604), “the inference engine 408 executes rules in the knowledge base 406” (606) and “modifies the fact library 404” (608). Ex. 1007,

11:38-40. This process continues until all rules are executed (610), and then parameter values are set (612). Ex. 1007, 11:42-53.

145. By way of example, Figures 7 to 9 illustrate using the “self-engineering system” for “*altering operating parameters*” relating to hand-off in a portion of a wireless communication system.” Ex. 1007, 11:65-12:1 (italics and bold formatting added.)



Ex. 1007, Figs. 7, 8 (displayed side-by-side for comparison).

146. “FIG. 7 illustrates construction of a wireless communication system soon after installation” where “hand held mobile units 712, 714, 716 and 718, as well as auto mobile installed mobile units 720, 722, 724 and 726, are served by the wireless communication system satisfactorily after installation.” Ex. 1007, 12:1-8. And, Figure 8 shows that “after the wireless communication system

has been installed for some time, the geographic area served changes as does the load served by the system.” Ex. 1007, 12:9-12. “Because both the mobility and number of units being served has changed as has the RF propagation within the area served by the wireless communication system, ***operating parameters that previously provided satisfactory performance no longer do so.***” Ex. 1007, 12:17-21 (italics and bold formatting added). For example, the handoff parameters need to be “altered.” Ex. 1007, 12:21-23. This is another way to say that the previous setting requirement rule that provided satisfactory performance needs to be deviated from based on an operational requirement deduced from the use of the radio network. Therefore, in my opinion, *Djoko* discloses the features of claim element 1a.

- c) **[1b] if the result indicates that the rule has been obeyed, storing the modified parameter in the network such that subsequent network operation will respond to the modified parameter.**

147. In my opinion, *Djoko* discloses this feature. As I discussed above for claim element [1pre], the merits of the altered parameters are evaluated using the simulator. “*Once a stable assignment has been achieved the results are implemented in the wireless communication system...*” See, e.g., Ex. 1007, 13:32-35. This is an example of storing the modified parameter in the network if the result indicates that the rule has been obeyed, i.e., a “stable assignment has been achieved,” such that subsequent network operation will respond to the modified

parameter, i.e., such that the stable results “are implemented in the wireless communication system.”

2. Claim 22

- a) **[22pre] A system for verifying a modified parameter obtained from changing an operational parameter of a component of a radio network, wherein the system comprises:**

[22a] a rule checker which, before the modified parameter is implemented in the network, checks the modified parameter on the basis of a rule so as to yield a result, said rule comprising both a technically sufficient parameter setting requirement and a deviation from the setting requirement based on an operational requirement deduced from use of the radio network; and

[22b] a data transferrer which, if the result indicates that the rule has been obeyed, stores the modified parameter in the network such that subsequent network operation will respond to the modified parameter.

148. In my opinion, *Djoko* is a system that performs the method of claim 1. This system anticipates claim 22 for the same reasons as those discussed above for claim elements [1pre] to [1b], which I incorporate here by reference. The programmed computer performs rule checking and provides the optimized parameter to the network, so it has a “rule checker” (§XI.C.1.b) and a “data transferrer” (§XI.C.1.c).

3. Claim 26

- a) **26. A radio network comprising a component having an operational parameter that can be changed to a modified parameter, the network comprising:**

a rule checker which, before the modified parameter is implemented in the network, checks the modified parameter on the basis of a rule so as to yield a result, said rule comprising both a technically sufficient parameter setting requirement and a deviation from the setting requirement based on an operational requirement deduced from use of the radio network; and

a data transferrer which, if the result indicates that the rule has been obeyed, stores the modified parameter in the network such that subsequent network operation will respond to the modified parameter.

149. In my opinion, *Djoko* is deployed in a radio network with adjustable parameters of various components (§XI.C.1). *Djoko* anticipates the features in these claim elements for the same reasons as those discussed above for claim elements [1pre] to [1b], which I incorporate here by reference. *Djoko*'s network includes a programmed computer that performs rule checking and provides the optimized parameter to the network, so it has a "rule checker" (§XI.C.1.b) and a "data transferrer" (§XI.C.1.c).

4. **Claim 28**

- a) **28. A computer program recorded on a computer readable media and containing computer executable instructions for execution on a computer system, the program comprising software code portions for verifying a modified parameter obtained from changing an operational parameter of a component of a radio network, wherein the instructions when executed cause the computer to:**

check, before the modified parameter is implemented in the network, the modified parameter on the basis of a rule so as to yield a result, said rule comprising both a technically sufficient parameter setting requirement and a deviation from the setting requirement based on an operational requirement deduced from use of the radio network; and

if the result indicates that the rule has been obeyed, store the modified parameter in the network such that subsequent network operation will respond to the modified parameter.

150. In my opinion, *Djoko* anticipates the features in these claim elements for the same reasons as those discussed above for claim elements [1pre] to [1b], which I incorporate here by reference. Additionally, the programmed computer in *Djoko* is stored on computer memory (a computer program recorded on a computer-readable media).

5. **Claim 31**

- a) **A data carrier having a computer program recorded thereon, the program containing computer executable instructions for execution on a computer system, the program comprising software code portions for verifying a modified parameter obtained from changing an operational parameter of a component of a radio network, wherein the instructions when executed cause the computer to:**

check, before the modified parameter is implemented in the network, the modified parameter on the basis of a rule so as to yield a result, said rule comprising both a technically sufficient parameter setting requirement and a deviation from the setting requirement based on an operational requirement deduced from use of the radio network; and

if the result indicates that the rule has been obeyed, store the modified parameter in the network such that subsequent network operation will respond to the modified parameter.

151. In my opinion, *Djoko* discloses a programmed computer. The programmed computer has memory (a data carrier) that stores a computer program that performs the method of claim 1, which is restated in this claim. Therefore, *Djoko* anticipates the features in these claim elements for the same reasons as those discussed above for claim elements [1pre] to [1b], which I incorporate here by reference.

D. Ground 4: *Djoko* in view of *Sheridan* renders obvious claims 2-6, 23-25, 29, and 32

1. Claims 2, 29 and 32

- a) **2. The method recited in claim 1 wherein the checking step comprises the steps of: copying the operational parameter from the radio network to a database; and changing the operational parameter to the modified parameter.**
- b) **29. The computer program recited in claim 28 wherein the instructions, when executed, further cause the computer to: copy the operational parameter from the radio network to a database; and change the operational parameter to the modified parameter.**
- c) **32. The data carrier recited in claim 31 wherein the instructions, when executed, further cause the computer system to: copy the operational parameter from the radio network to a database; and change the operational parameter to the modified parameter.**

152. As I explained previously, *Djoko* anticipates claims 1, 28, and 31.

Furthermore, in my opinion, *Djoko* discloses a “fact library” that “includes the current operating parameters and proposed operating parameters.” *See, e.g.*, Ex. 1007, 10:30-40. *Djoko* teaches to rely upon “available mechanisms to collect current operating data.” Ex. 1007, 10:1-3. And, while *Djoko* does not teach to “copy” the operational parameters from the network to its “fact library” (database), a POSITA would have found coping an obvious implementation of the available mechanisms for collecting the operating parameters.

153. Copying parameters from a network was well within the knowledge and skill of a POSITA. The '705 patent admits this when discussing *Madebrink* and stating that it was known to copy cell parameters to a database and store them along so that proposed changes can be prepared and verified before implementing the altered parameters into the network. Ex. 1001, 1:56-67.

154. *Sheridan* discloses a system for cellular network configuration and management. *See, e.g.*, Ex. 1008, 1:5-6. Therefore, in my opinion, a POSITA would have been encouraged to look to *Sheridan* when looking at the “available mechanisms” for collecting the current operating parameters in *Djoko*’s system. Having looked at *Sheridan*, a POSITA would have recognized that it teaches a cell configuration system having “a data reception and storage system 602.” *See, e.g.*, Ex. 1008: 7:8-12. This system receives a copy of “configuration data” from the cell site complex 108, which includes the network 206. Ex. 1008, 5:35-38; 3:40-41. Therefore, in my opinion, a POSITA relying on their knowledge and skill and having read *Sheridan*, would have found it straightforward and obvious to use the available mechanism of copying parameters from the network to a database as the technique for collecting the current operating parameters in *Djoko*’s system.

155. As I discussed above, *Djoko* discloses *altering* (changing) the current operational parameter to the modified parameter before deploying the

modified parameter into the network. Therefore, in my opinion, *Djoko* in view of *Sheridan* renders obvious claims 2, 29 and 32.

2. Claims 6, 23

- a) **6. The method recited in claim 2 further comprising the steps of: storing the operational parameter in a first part of the database; and storing the modified parameter in a second part of the database.**
- b) **23. The system recited in claim 22 further comprising: a first part of a database for storing the operational parameter from the radio network; and a second part of the database for storing the modified parameter.**

156. As I explained previously, *Djoko* renders obvious claim 2 and anticipates claim 22. Furthermore, in my opinion, *Djoko* as modified by *Sheridan* and the knowledge of a POSITA renders obvious the features of claims 6 and 23. Specifically, the fact library 404 (“database”) “includes the current operating parameters and proposed operating parameters” that are stored in separate parts of the database, i.e., “Fact 1 through Fact N”. *See, e.g.*, Ex. 1007, 10:38-42. Thus, the *Djoko Sheridan* combination from claims 2, 29, and 32, stores the operational parameter in the first part of the database, e.g., Fact 1, and stores the modified parameter in the second part of the database, e.g., Fact 2, which is stored separately from Fact 1.

3. Claims 3, 24, 25

- a) **3. The method recited in claim 2 further comprising the step of generating a non-compliance signal if the modified parameter does not obey the operational requirement.**
- b) **24. The system recited in claim 23 further comprising a signal generator which generates a non-compliance signal if the modified parameter does not obey the operational requirement.**
- c) **25. The system recited in claim 23 further comprising scripting means which define rules and/or error messages that are to be used by the rule checker.**

157. As I explained previously, the *Djoko* renders obvious claims 2 and 23. Furthermore, in my opinion, *Djoko* as modified by *Sheridan* and the knowledge of a POSITA discloses the features of claims 3, 24, and 25. For example, *Djoko*'s self-engineering system 100 includes *audit* and parameter adjustment functions. *See, e.g.*, Ex. 1007, 6:20-23. The audit function "reports configuration errors to a system operator." Ex. 1007, 6:23-29. Reporting configuration errors is an example of generating a non-compliance signal if the modified parameter does not obey the operational requirement. Reporting configuration errors is also an example of the computer program described by claim 25 that defines the rules and error messages used by the simulator in the combined system.

4. Claim 4

- a) **The method recited in claim 3 wherein the non-compliance signal is a file or message displayed to an operator.**

158. As I explained previously, *Djoko* makes obvious claim 3.

Furthermore, in my opinion, *Djoko* as modified by *Sheridan* and the knowledge of a POSITA discloses the feature of claim 4. Although the format of the “report” is not disclosed in *Djoko*, a POSITA would have found it straightforward and obvious to display a message to a system operator. Indeed, *Sheridan* discloses doing just that for configuration errors. *See, e.g.*, Ex. 1008, 8:34-42. And a POSITA would have found it straightforward and obvious to “report” a configuration error by displaying a message to an operator.

5. Claim 5

- a) **The method recited in claim 3 wherein the non-compliance signal is programmable.**

159. As I explained previously, *Djoko* makes obvious claim 3.

Furthermore, in my opinion, *Djoko*, as modified by *Sheridan* and the knowledge of a POSITA, renders obvious the feature of claim 5. *See, e.g.*, Ex. 1008, 3:9-10 (“Alarms are reported when parameters are outside of an *allowable* range.”) (italics formatting added)). Although the format of the “report” is not disclosed in *Djoko*, a POSITA would have found it straightforward and obvious to program the “report” (non-compliance signal) to display a message to a system operator or to provide a

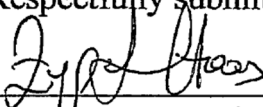
visual warning. Indeed, *Sheridan* discloses doing just that for configuration errors. *See, e.g.*, Ex. 1008, 8:34-42. As I previously explained, the concept of providing a report in a visual or audible manner was well-known in the art. *See, e.g.*, Ex. 1013, 22:62-65 (using a display on the screen, audible warning, or other means to alert a network designer of network errors.) A POSITA would have found it straightforward and obvious to visually “report” a configuration error by displaying a message to an operator.

XII. CONCLUSION

160. My findings and opinions set forth in this Declaration are based on my work and examination to date. I may continue my examinations in view of additional documents and/or other factual evidence as they become available to me over the course of this proceeding, and that may necessitate supplementing and/or refining my opinions. I reserve the right to add to, alter, or delete my opinions and my Declaration when additional information becomes available to me.

161. I declare that all statements made herein on my own knowledge are true and that all statements made on information and belief are believed to be true, and I will testify as such if called upon to do so.

Dated: February 14, 2023

Respectfully submitted,
By: 
Zygmunt Haas, Ph.D.